

# CPC COOPERATIVE PATENT CLASSIFICATION

## G PHYSICS (NOTES omitted)

### INSTRUMENTS

#### G05 CONTROLLING; REGULATING (NOTES omitted)

**G05F SYSTEMS FOR REGULATING ELECTRIC OR MAGNETIC VARIABLES** (regulating the timing or recurrence frequency of pulses in radar or radio navigation systems [G01S](#); regulation of current or voltage, specially adapted for use in electronic time-pieces [G04G 19/02](#); closed-loop systems for regulating non-electric variables by electric means [G05D](#); regulating power supply of digital computers [G06F 1/26](#); for obtaining desired operating characteristics of electromagnets with armatures [H01F 7/18](#); regulating electric power distribution networks [H02J](#); regulating the charging of batteries [H02J 7/00](#); regulation of the output of static converters, e.g. switching regulators [H02M](#); regulation of the output of electric generators [H02N](#), [H02P 9/00](#); controlling transformers, reactors or choke coils [H02P 13/00](#); regulating frequency response, gain, maximum output, amplitude or bandwidth of amplifiers [H03G](#); regulating tuning of resonant circuits [H03J](#); regulating characteristics of transmission lines [H04B](#); controlling electric light sources [H05B 39/04](#), [H05B 41/36](#), [H05B 45/10](#), [H05B 45/20](#), [H05B 47/10](#); electric control of X-ray apparatus [H05G 1/30](#))

#### NOTES

- This subclass covers:
  - systems only;
  - use of hydraulic, pneumatic, mechanical, and electrical motors for varying electric characteristics of devices which restore the quantity regulated;
  - the combination of static converters and current or voltage regulators, if the invention resides in the combination.
- This subclass does not cover elements per se, which are covered by the relevant subclasses.

#### WARNINGS

- The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
 

<a href="#">G05F 3/28</a>	covered by	<a href="#">G05F 3/26</a>
<a href="#">G05F 5/02</a>	covered by	<a href="#">G05F 5/00</a>
<a href="#">G05F 5/04</a>	covered by	<a href="#">G05F 5/00</a>
<a href="#">G05F 5/06</a>	covered by	<a href="#">G05F 5/00</a>
<a href="#">G05F 5/08</a>	covered by	<a href="#">G05F 5/00</a>
- In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00	<b>Automatic systems in which deviations of an electric quantity from one or more predetermined values are detected at the output of the system and fed back to a device within the system to restore the detected quantity to its predetermined value or values, i.e. retroactive systems</b>	1/10	. Regulating voltage or current ( <a href="#">G05F 1/02</a> takes precedence; for electric railways <a href="#">B60M 3/02</a> )
		1/12	. . wherein the variable actually regulated by the final control device is ac ( <a href="#">G05F 1/625</a> takes precedence)
1/02	. Regulating electric characteristics of arcs (arrangements for feeding electrodes <a href="#">B23K 9/12</a> , <a href="#">H05B 7/109</a> , <a href="#">H05B 31/18</a> ; automatic control of power for heating by discharge <a href="#">H05B 7/148</a> )	1/13	. . . using ferroresonant transformers as final control devices
1/04	. . by means of saturable magnetic devices	1/14	. . . using tap transformers or tap changing inductors as final control devices
1/06	. . by means of discharge tubes	1/147	. . . . with motor driven tap switch
1/08	. . by means of semiconductor devices	1/153	. . . . controlled by discharge tubes or semiconductor devices
		1/16	. . . . combined with discharge tubes or semiconductor devices

- 1/20 . . . . semiconductor devices only
- 1/22 . . . . combined with separate magnetic control devices having a controllable degree of saturation
- 1/24 . . . . using bucking or boosting transformers as final control devices
- 1/247 . . . . with motor in control circuit
- 1/253 . . . . the transformers including plural windings in series between source and load ([G05F 1/247 takes precedence](#))
- 1/26 . . . . combined with discharge tubes or semiconductor devices
- 1/30 . . . . semiconductor devices only
- 1/32 . . . . using magnetic devices having a controllable degree of saturation as final control devices
- 1/325 . . . . with specific core structure, e.g. gap, aperture, slot, permanent magnet
- 1/33 . . . . with plural windings through which current to be controlled is conducted
- 1/335 . . . . on different cores
- 1/34 . . . . combined with discharge tubes or semiconductor devices
- 1/38 . . . . semiconductor devices only
- 1/40 . . . . using discharge tubes or semiconductor devices as final control devices
- 1/42 . . . . discharge tubes only
- 1/44 . . . . semiconductor devices only
- 1/445 . . . . being transistors in series with the load
- 1/45 . . . . being controlled rectifiers in series with the load
- 1/452 . . . . . {with pulse-burst modulation control}
- 1/455 . . . . . with phase control
- 1/46 . . . . wherein the variable actually regulated by the final control device is dc ([G05F 1/625 takes precedence](#))
- 1/461 . . . . {using an operational amplifier as final control device}
- 1/462 . . . . {as a function of the requirements of the load, e.g. delay, temperature, specific voltage/current characteristic}
- 1/463 . . . . {Sources providing an output which depends on temperature}
- 1/465 . . . . {Internal voltage generators for integrated circuits, e.g. step down generators}
- 1/466 . . . . {Sources with reduced influence on propagation delay}
- 1/467 . . . . {Sources with noise compensation}
- 1/468 . . . . {characterised by reference voltage circuitry, e.g. soft start, remote shutdown}
- 1/52 . . . . using discharge tubes in series with the load as final control devices
- 1/54 . . . . additionally controlled by the unregulated supply
- 1/56 . . . . using semiconductor devices in series with the load as final control devices ([G05F 1/461 takes precedence](#))
- 1/561 . . . . {Voltage to current converters (amplifiers [H03F](#))}
- 1/562 . . . . {with a threshold detection shunting the control path of the final control device}
- 1/563 . . . . including two stages of regulation at least one of which is output level responsive, e.g. coarse and fine regulation
- 1/565 . . . . sensing a condition of the system or its load in addition to means responsive to deviations in the output of the system, e.g. current, voltage, power factor ([G05F 1/563 takes precedence](#))
- 1/567 . . . . . for temperature compensation
- 1/569 . . . . . for protection
- 1/571 . . . . . with overvoltage detector
- 1/573 . . . . . with overcurrent detector
- 1/5735 . . . . . {with foldback current limiting}
- 1/575 . . . . characterised by the feedback circuit
- 1/577 . . . . for plural loads
- 1/585 . . . . providing voltages of opposite polarities
- 1/59 . . . . including plural semiconductor devices as final control devices for a single load
- 1/595 . . . . semiconductor devices connected in series
- 1/607 . . . . using discharge tubes in parallel with the load as final control devices
- 1/61 . . . . including two stages of regulation, at least one of which is output level responsive
- 1/613 . . . . using semiconductor devices in parallel with the load as final control devices ([G05F 1/461 takes precedence](#))
- 1/614 . . . . including two stages of regulation, at least one of which is output level responsive
- 1/618 . . . . using semiconductor devices in series and in parallel with the load as final control devices ([G05F 1/461 takes precedence](#))
- 1/62 . . . . using bucking or boosting dc sources
- 1/625 . . . . wherein it is irrelevant whether the variable actually regulated is ac or dc
- 1/63 . . . . using variable impedances in series with the load as final control devices
- 1/635 . . . . being Hall effect devices, magnetoresistors or thermistors
- 1/644 . . . . being pressure-sensitive resistors
- 1/648 . . . . being plural resistors among which a selection is made
- 1/652 . . . . using variable impedances in parallel with the load as final control devices
- 1/656 . . . . using variable impedances in series and in parallel with the load as final control devices
- 1/66 . . . . Regulating electric power
- 1/67 . . . . to the maximum power available from a generator, e.g. from solar cell
- 1/70 . . . . Regulating power factor; Regulating reactive current or power
- 3/00 Non-retroactive systems for regulating electric variables by using an uncontrolled element, or an uncontrolled combination of elements, such element or such combination having self-regulating properties {(current generators specially designed for use in phase-locked loops [H03L 7/0891](#))}**
- 3/02 . . . . Regulating voltage or current
- 3/04 . . . . wherein the variable is ac
- 3/06 . . . . using combinations of saturated and unsaturated inductive devices, e.g. combined with resonant circuit
- 3/08 . . . . wherein the variable is dc
- 3/10 . . . . using uncontrolled devices with non-linear characteristics
- 3/12 . . . . being glow discharge tubes

**G05F**

- 3/16 . . . . . being semiconductor devices
- 3/18 . . . . . using Zener diodes
- 3/185 . . . . . {and field-effect transistors}
- 3/20 . . . . . using diode- transistor combinations  
([G05F 3/18](#) takes precedence)
- 3/205 . . . . . {Substrate bias-voltage generators (for static stores [G11C 5/146](#))}
- 3/22 . . . . . wherein the transistors are of the bipolar type only ([G05F 3/26](#), [G05F 3/30](#) take precedence)
- 3/222 . . . . . {with compensation for device parameters, e.g. Early effect, gain, manufacturing process, or external variations, e.g. temperature, loading, supply voltage}
- 3/225 . . . . . {producing a current or voltage as a predetermined function of the temperature}
- 3/227 . . . . . {producing a current or voltage as a predetermined function of the supply voltage}
- 3/24 . . . . . wherein the transistors are of the field-effect type only ([G05F 3/205](#), [G05F 3/26](#), [G05F 3/30](#) take precedence)
- 3/242 . . . . . {with compensation for device parameters, e.g. channel width modulation, threshold voltage, processing, or external variations, e.g. temperature, loading, supply voltage}
- 3/245 . . . . . {producing a voltage or current as a predetermined function of the temperature}
- 3/247 . . . . . {producing a voltage or current as a predetermined function of the supply voltage}
- 3/26 . . . . . Current mirrors
- 3/262 . . . . . {using field-effect transistors only}
- 3/265 . . . . . {using bipolar transistors only}
- 3/267 . . . . . {using both bipolar and field-effect technology}
- 3/30 . . . . . Regulators using the difference between the base-emitter voltages of two bipolar transistors operating at different current densities ([G05F 3/26](#) takes precedence)

**5/00** **Systems for regulating electric variables by detecting deviations in the electric input to the system and thereby controlling a device within the system to obtain a regulated output**

**7/00** **Regulating magnetic variables (details of apparatus for measuring magnetic variables involving magnetic resonance [G01R 33/28](#))**